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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,775	01/11/2001	Jignesh V. Gandhi	72880/04796	1726

23380 7590 10/22/2003

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EXAMINER	
AKKAPEDDI, PRASAD R	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/758,775	GANDHI ET AL.	
	Examiner	Art Unit	
	Prasad R Akkapeddi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 August 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-40* is/are pending in the application.

4a) Of the above claim(s) *8-21 and 35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-34 and 36-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *13* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings filed on 04/21/2003 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Response to Arguments

2. Applicant's arguments see Amendment and Response, filed 08/01/2003, with respect to the rejection(s)of claim(s) 22-34 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Van Sprang and Schmidt et al.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 22-28 and 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Sprang (U.S.Patent No. 5,490,003) in view of Schmidt et al. (Schmidt) (U.S.Patent No. 5,576,854).

Van Sprang discloses a projection device (Fig. 8) for use in high contrast reflective color displays with a twisted nematic mode reflective liquid crystal cell (1), a source having one of the three composite colors (col. 4, lines 48-50), i.e., light having a particular color enters the liquid crystal cell and hence has some kind of a color filter (though not disclosed explicitly), a linear polarizer (11) positioned between the color light and the liquid crystal cell, an analyzer (12) positioned in the path of the light reflected by the liquid crystal cell and the light incident is generally off-axis to said liquid crystal cell (Fig. 1). Van Sprang also discloses that the picture electrodes (7) and the switching elements for driving the picture electrodes are provides in a silicon substrate (col. 4, lines 21-24), hence the liquid crystal cell is a LcoS cell, as recited in claims 22 and 36. Van Sprang does not explicitly disclose that the light is incident at 10 –20 degrees off-axis. However, the light as shown in Fig. 1 does appear to be incident about a similar angle.

Though van Sprang discloses that the twist angle is in between 50 to 68 degrees, in Fig. 5 van Sprang discloses a range of twist angles from 25 to 80 degrees with an optimum angle between 50 to 68 degrees. Hence the angle as recited in claims 26 and 40 would have been obvious to a person of ordinary skill.

Van Sprang also discloses that the directions of the polarizations of the polarizer (21) and the analyzer (22) are perpendicular (Fig. 2), as recited in the instant claims 28 and 38.

Though Van Sprang's invention deals with achieving high contrast displays by reducing the ellipticity and residual transmission in the extinguished state over a wide wavelength range (460nm – 620nm) (col. 3, lines 36-51), van Sprang does not explicitly disclose the use of phase retarders in removing the ellipticity of the reflected light.

Schmidt on the other hand, in disclosing a liquid crystal light valve with off-axis incident reflections discloses a retarder having a quarter-wave plate (26) with added additional amount of retardance (col. 5, lines 20-35) to compensate for the birefringence in the LCLV. Schmidt also teaches the difference in polarization and ellipticity of light reflected by the liquid crystal cell and the polarization and ellipticity of the incident light (col. 2, lines 38-65).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the phase retarder as disclosed by Schmidt to the display of van Sprang to have an off or black level that is as black as possible to improve the contrast ratio and to produce higher quality projected images (col. 2, lines 26-31).

5 Claims 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over van Sprang and Schmidt as applied to claim 22 above, and further in view of Ohnishi et al. (Ohnishi) (U.S.Patent No. 5,089,906).

Though van Sprang and Schmidt disclose a light valve with a twisted nematic liquid crystal cell having a polarizer, an analyzer and a retarder to reduce the birefringence effects (ellipticity), neither of them go in great lengths about the specific retardation values of the retarder (such as 430-630nm in the red band, 350-550nm in the green band and 280-460nm in the blue band, as recited in the instant claims), especially as a function of retardation angle at various bands of wavelengths.

Ohnishi in disclosing a supertwisted nematic liquid crystal device having two phase difference plates (retarders) for providing black/white display, discloses several possible retardation values (from 330nm to 500nm, Table 1) at several retardation angles (20 to 40 degrees) at the blue (450nm), green (550nm) and red (650nm) wavelengths (Figs. 10-20). Ohnishi also discloses the effect of ellipticity in the beam and its effect on transmittance (figs. 3-9).

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal/sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.). See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

In this case, an optimum retardation value for the retarder is essential, otherwise right amount of light blockage (for dark state) or light leakage (for white state) cannot be achieved. Hence choosing the optimum retardation for the phase plate is critical and the retardation value is the results-effective variable.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the various retardation values for the specific retarder plate to obtain a sharp black/white display while being smaller in thickness and weight (col. 1, lines 50-55).

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. (a) Wiener-Avnear (U.S.Patent No. 4,408,839) and (b) Uchida et al. (U.S.Patent No. 6,219,122).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

BRA

Prasad R Akkapeddi
Examiner
Art Unit 2871

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TOAN TON
PRIMARY EXAMINER